

DOE - Fossil Energy Techline - Issued on: September 9, 2005

## **Award-Winning Engine Powered Solely by Water**

### ***Field Testing Proves Thermal Hydraulic Engine Pumps Oil without the Need for Fuel or Electricity***

**Casper, WY** –The Federal Laboratory Consortium will recognize DOE's Rocky Mountain Oilfield Testing Center (RMOTC) and Deluge, Inc. with its coveted "Outstanding Technology Development" award for the development and testing of the Thermal Hydraulic Engine, known as the Natural Energy Engine™. This far reaching, innovative technology has been nicknamed the NE Engine™ because it can literally replace *any engine*.

The engine – used to drive an oil pump – operates without fuel or electricity, just hot and cold water. The concept is similar to that of a thermometer. Thermometers rely on the simple principle that a liquid changes its volume relative to its temperature. Liquids take up less space when they are cold and more space when they are warm, hence the liquid in a bulb thermometer rises when the temperature rises, and falls when the temperature cools down. The same principle applies with the NE Engine™.

Two separate pipes are hooked to the engine, one supplying hot water (at 175 degrees Fahrenheit) from a nearby naturally-occurring aquifer, and the second supplying cooler water (at 68 degrees Fahrenheit) from a nearby storage tank. Each pipe has a valve which is turned on and off with an electronic timer. The timer opens the hot water valve, allowing water to enter the heat exchanger where it heats pressurized liquid carbon dioxide. The liquid carbon dioxide expands in volume, pushing up the engine's piston. The timer then opens the cold water valve to cool the carbon dioxide, contracting the liquid volume and lowering the piston. The pipe then drains the water from the engine. The piston drives a pump that lifts oil from the well, and that oil is piped to a storage tank.

This super quiet engine is entirely pollutant free and could revolutionize mechanical engineering in much the same way as the semi-conductor transistor changed electrical engineering forever.

"The RMOTC project was a big step in bringing our NE Engine™ to commercialization" said Brian Hageman, of Deluge, Inc. The RMOTC test proved that the engine was able to pump a 400-foot deep oil well with power to spare. When the well's downhole configuration was modified to mimic a 1600-foot deep well, it was still able to pump oil out of the well bore. Doug Tunison, RMOTC Manager, observed that, "The RMOTC-Deluge partnership presented a unique opportunity to synthesize fossil and renewable energy technologies. The lessons learned in the field scale demonstration were invaluable in making multiple enhancements to the inventor's concept."

Oil is just the beginning of potential applications for the thermal hydraulic engine, says Brian Hageman of Deluge, Inc. Other applications may include pumping water or natural gas, pumps for desalination plants, Freon compression and ventilation systems. Mr. Hageman continued, "The versatility of the NE Engine™ is that it can use a variety of heat sources such as solar thermal, geothermal, ocean thermal, industrial waste heat and biomass to heat the water that fuels it."

The Federal Laboratory Consortium is a nationwide network of federal laboratories that brings laboratories together with potential users of government-developed technologies. The award will be presented at the FLC 2005 Mid-Continent Region Meeting this September.

- End of *Techline* -

#### **MORE INFO**

- [Learn more about DOE's Rocky Mountain Oilfield Testing Center](#)

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